

**Reach of the media and intention to quit smoking in India: A Study of
Global Adult Tobacco Survey 2016-2017**

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Abstract

This study focuses on how the media affects public perception of smoking's harmful effects and the efficacy of tobacco control programs. It examines gender disparities in smoking habits and awareness of anti-tobacco campaigns among 74,037 adults aged 15 and older using data from the second round of Global Adult Tobacco Survey (GATS). It also examines the effect of the media on smokers' intention to stop. In India, a household survey known as the GATS was conducted between 2016 and 2017. The poll found that across all media, anti-smoking material via electronic media was noticed more frequently by the participants. In comparison to non-smokers, smokers are also less likely to be aware of the health risks associated with smoking. Observing anti-tobacco messaging and being aware of the health risks of smoking are strongly connected with the intention to quit in India. Compared to women, men are more likely to detect anti-smoking information on any media. Uneducated people are less likely to notice the anti-smoking information on any media as well as they are among the ones who are least aware of the harmful effects of tobacco smoking. People who noticed anti-smoking information on any media were more likely to be aware that smoking cause illness. Smokers who noticed the information about dangers of smoking were more likely to intend quitting than the ones who did not notice any such information.

Introduction

In 2016, smoking was the major preventable cause of death in the world, accounting for over one out of every eight deaths. Only smoking caused approximately 100 million deaths in the 20th century. (2) Amongst the 1.3 billion tobacco users, over 80% of the tobacco users live in low and middle-income countries. (12) Each year, tobacco usage accounts for more than 1 million fatalities in India (9.5% of all causes of death). The Global Adult Tobacco Survey (GATS)-2 datasheet of India reports that 10.7% are smokers and 21.4% use smokeless tobacco users, constituting 28.6% of the country's population. (3) Tobacco is consumed in a variety of ways, including smoking and smokeless tobacco, in India. Contrary to the more popular use of cigarettes in urban areas, bidi is the most common smoking product consumed in rural communities. (8)

To address the global tobacco pandemic, the World Health Organization Framework for Tobacco Control (WHO-FCTC) was formed in 2003. (2) Since that time, 168 nations have ratified the treaty. Only around 28% of people worldwide are exposed to successful anti-tobacco mass media programs. In terms of anti-tobacco mass media campaigns, India ranks in the top 24 nations. (4) Previously, neither the Central Government of India nor the State Governments gave tobacco a significant role in their public education campaigns. Immunization, TB, malaria, and drug and alcohol abuse were given top billing. The least attention was paid to tobacco control awareness education, and there is little indication of a systematic or coordinated effort on the part of the federal or state governments to inform the public about tobacco use. Ministry of health and family welfare(MOHFW) had lately started, awareness-raising campaigns using print and broadcast media under National Tobacco Control (NTC) cell.(2) National Tobacco Control program for anti-smoking campaigns with a powerful statement can influence smokers and non-smokers to change their behavior and force tobacco users to stop. Through mass media, anti-smoking and

anti-smokeless tobacco marketing and campaigns can raise public awareness of the harmful effects of both smoking and smokeless tobacco (2,3) Males all around the nation frequently smoke tobacco, primarily in the form of cigarettes and bidis. Smoking can be reduced in India with the help of anti-smoking messages transmitted through the media. The effective campaign emphasizes the negative effects of smoking and has been proven to have an impact. (2,3) According to the Global Adult Tobacco Survey (GATS) 2016–2017, 92% of respondents in India believe smoking causes severe illnesses and 96% say SLT can cause significant illness. (5) It has been demonstrated that reading about tobacco risks in the newspaper is associated with lower smoking rates and higher levels of anti-smoking sentiment. Despite significant contributions from the developed world to the body of information on tobacco use, it is now generally acknowledged that poorer countries would undoubtedly bear a disproportionate share of the expenses associated with tobacco use. (6)

Review of Literature

The GATS I reported that overall, 58.6% of the population has been exposed to anti-smoking information on any media and the person who has noticed the information on multiple channels is 90% more willing to quit smoking than the one who didn't notice any anti-smoking information. (7) The impact of anti-tobacco community education programs, which provided health education through films and images with information about the detrimental effects of tobacco, was the subject of one study carried out in Kolar (Karnataka). According to the survey, male and female cigarette usage rates decreased by 10.2% and 16.3%, respectively. (2) According to the GATS I survey study, those in the 41–50 age range had 0.83 times lower odds of intending to quit compared to people in the 50-plus age range (95% CI 0.73-0.93, p 0.001). Increased attempts to quit were

increasingly correlated with educational achievement. The adjusted odds ratio (AOR) of making a quit attempt was 1.14 (95% CI 1.02-1.27, p 0.001) among those with education up to primary level compared to those with no or inadequate education. (9)

The study focusing on the trans theoretical constructs of quitting behavior in smokers of the GATS II population has reported that the smokers who are exposed to the anti-smoking information on more than three sources have the highest odds (2.193, 95% CI-2.190 to 2.195) of intending to quit than the ones who didn't notice the anti-smoking information. (10) Moreover, very few of other research in India have shown that successful quitting has occurred because of self-motivation and encouragement through personal communication and mass media. This requires increased dissemination of anti-tobacco messages through the described media. According to this study, tobacco users who notice anti-tobacco messages in movies and newspapers were 31% more likely be willing to quit their habit of tobacco smoking than their counterparts. (11)

The Rationale for The Study

Given that media use exposes the audience to anti-smoking information, the goal of this essay is to determine the extent to which exposure to mass media is associated with raising awareness in India. The idea is that by comprehending and cataloging patterns of the many effects of media consumption on tobacco use, it will be possible to create effective communication campaigns to encourage nicotine cessation. According to this premise, the main study question in this work is: How far did anti-smoking messages in Indian media reach both smokers and non-smokers? This study will evaluate how the mass media contributes significantly to raising awareness of the dangers of tobacco use and how it can increase the quitting rate of tobacco users in addition to examining the distinctive patterns of media exposure to anti-smoking information. Also, for the first round of the GATS, to

measure the reach of media with anti-smoking information the option for noticeability on cinema, internet, public transportation, and public walls was not available. This study will help us understand the distribution of noticeability of anti-smoking information among these added options.

Objectives of the study

- 1) To understand the extent of media exposure to anti-smoking information in different types of media among the population according to their background characteristics.
- 2) To understand the extent of awareness among the population about the harmful effects of tobacco smoking.
- 3) To examine the relationship between exposure to anti-smoking information and the awareness about the harmful effects of tobacco smoking.
- 4) To examine the relationship between exposure to information that encourages to quit smoking and the intention to quit smoking among smokers.

Study Methodology

Data source

The second round of the GATS (Global Adult Tobacco Survey) was conducted in 2016–17, we analyzed this secondary data. A cross-sectional household-based survey of individuals in a nationally representative sample was carried out. GATS used a worldwide defined technique for sampling, questionnaire preparation, data collection, on and data processing, as well as weighting as part of the Global Tobacco Surveillance System (GTSS). The survey gathers data on tobacco use, tobacco smoking cessation, secondhand smoke, tobacco economics, and media, knowledge, attitudes, and perceptions. The data was collected from August 2016 to February 2017 by the Tata Institute of Social Sciences, Mumbai, with technical support from

international partners. GATS 2 India was conducted in all 30 states and 2 Union Territories covering about 99.9% of the total population. The GATS coding manual was used to categorize and define the variables. (4)

The original data set of GATS India 2016-2017 was used, which is available for public use from the CDC website.

The data have been taken from CDC website,

[CDC - GTSSData: Datasets](#)

Operational definitions

We defined our variables as per the publicly available codebooks for GATS II.

Electronic media: The exposure of anti-smoking messages through the medium of TV, Internet, Cinema, and Radio was defined as electronic media.

Print Media: The exposure of anti-smoking messages through the medium of newspapers/magazines, billboards/hoardings were defined as print media.

Tobacco smokers: The information regarding this variable was derived from the question “Do you currently smoke tobacco on a daily basis, less than daily or not at all?”. Those who answered the question with the response of “daily” and “less than daily” were considered “current tobacco smokers”

Non-smokers: Those who answered with the response of “not at all” to the question “Do you currently smoke tobacco on a daily basis, less than daily or not at all?” were considered as non-smokers.

Awareness that smoking causes serious illness:

Respondents who answered the question “Based on what you believe or know that smoking causes serious illness?” with a “Yes” response was considered as aware.

Intention to quit smoking: The smokers who responded to the question,

“Did any of the information you just reported noticing about the dangers of smoking tobacco in the last 30 days lead you to think about quitting smoking?” with “Yes” was considered as the smokers who intend to quit smoking.

Or

” Which of the following best describes your thinking about quitting smoking?” with the response of “Quit Within the Next Month” “Thinking Within The Next 12 Months” and “Quit Someday” was considered as the smokers who intend to quit smoking.

Anti-smoking information

Anti-smoking information was defined as the any information which gives the information about dangers of tobacco smoking or that encourages to quit smoking.

Any media

If respondents answered the following question,

“In the last 30 days, have you noticed information about the dangers of smoking tobacco or that encourages quitting in any of the following places?”

With either Newspaper or TV or radio or internet or billboards or cinema or public vehicle or public walls or somewhere else was considered that the respondent have noticed information on Any media.

Study Variables

Dependent variables

In this study, we assessed three dependent variables.

The first variable “Noticed anti-smoking information on any media” was obtained from the question ““In the last 30 days, have you noticed information about the dangers of smoking tobacco or that encourages quitting in any of the following places?” Newspaper/magazine

The second variable “Awareness regarding the harmful effect of tobacco” was derived from the question “Based on what you know or believe, does smoking tobacco cause serious illness?” among all participants.

The third variable “Intention to quit smoking” was derived from the questions, “Did any of the information you just reported noticing about the dangers of smoking tobacco in the last 30 days lead you to think about quitting smoking?” or “Did any of the information you just reported noticing about the dangers of smoking tobacco in the last 30 days lead you to think about quitting smoking?” with “Yes” was considered as the smokers who intend to quit smoking.

Independent variables

Socio-demographic variables: We considered demographic variables including

Age groups (4 categories: 15-29, 30-44, 45-59, & ≥60 years) gender (male/female),

Residence (urban/rural),

Region (north, central, east, northeast, west, south),

Education level (4 categories: No formal schooling, up to primary education, up to secondary education, and higher secondary and above),

Employment (5 categories: Gov. and Non-gov employees, daily wage laborer, self-employed, student, homemaker + unemployed + employed),

Have TV, Have radio, Have internet connection, have a cell telephone.

The smoking-related variable smoking status was based on the question “Do you currently smoke tobacco on a daily basis, less than daily, or not at all?” The respondents who answered daily or less than daily were considered as smokers, the responses of not at all were considered as non-smokers.

The variable of smoking frequency was created from the same question with two categories smokers who smoke daily and less than daily.

The Age of smoking initiation was derived from the question” How old were you when you first started smoking tobacco daily?” The responses were categorized into 3 categories. <15 years, 15-29 years, and >25 years.

The variable ‘Noticed any smoking promotion or advertisement was obtained from the question “In the last 30 days, have you noticed any advertisements or signs promoting smoking tobacco products in the following places?” If the respondents answered Yes to any of the given options, the “Yes” response was recorded. The response was recoded as “0=No” , “1=Yes”.

Data analysis

The analysis of the extracted data was conducted using SPSS (Statistical Product and Service Solution, formerly known as Statistical Package for Social Sciences) version 26 developed by IBM.

Descriptive statistics and chi-square tests were done to study the distribution and association of the noticeability of anti-smoking information on any media according to the background characteristics of smokers and non-smokers. The exposures and covariates were stratified. Statistical significance, defined as $P < 0.05$, was evaluated through the Chi-square test. Logistic regression models were used to examine unadjusted and adjusted relationships between relevant exposures (noticed information about the risks of tobacco use or that encourages quitting on billboards, radio, television, the internet, movies, and walls) and outcomes

(awareness about the harmful effects of tobacco smoking, intention and attempts to quit smoking). P values, odds ratios, and 95% confidence intervals (CI) were reported.

Results

Sample characteristics

In GATS-II, there were 74037 participants; among them, 12.8% (9499) were smokers and 87.2% (64538) were non-smokers. The one fourth (23%) of the respondents live in North region of India. Around three fourth (73.5%) of smokers reside in rural areas. The 36.4% of the smokers were in the 30-44 years of age group. Around 30.6% of smokers have completed their education up to the primary level. The background characteristics of the respondents as well as the smokers and non-smokers are presented in Table 1.

Noticeability of the anti-smoking information on different media

Table 2 & 3 represents the reach of electronic media, print media, public, and any media. Overall, 76% of the total population noticed anti-smoking in any public or electronic, or print media i.e., any media during the last 30 days. The highest proportion of males (77.2%) and females (65.9%) had noticed the anti-smoking information on electronic media. 87.1% of the people living in the south region had seen anti-smoking information on electronic media. Other key elements that have a significant impact on the recall of anti-smoking information from any media are educational achievement and urban location of residence.

Highly significant gradually increasing odds of exposure to anti-smoking information in any media was observed as the level of education increased. People who had completed their higher secondary and above education had the highest odds (AOR=4.89, CI=4.51-5.30) of noticing anti-smoking information compared to those who had not done any schooling. Older people (60 years and above) are less likely to notice anti-smoking (OR=0.75; CI=0.70-0.80) in any

media. Those who watched television ($OR^1=1.36$; $CI^2=1.25-1.48$) and listened to radio ($OR=3.85$; $CI=3.68-4.04$) in their homes are more likely to have noticed anti-smoking information from any media. As well as respondents who have an internet connection ($OR=1.54$, $CI=1.43-1.66$) and cell telephones ($OR=1.73$, $CI=1.62-1.84$) have higher odds of noticing the anti-smoking information on any media. Out of 64538 respondents who don't smoke 76.4% ($P<0.05$) have noticed information about the dangers of tobacco smoking. Only 49.1% of the total rural population had been exposed to anti-smoking information whereas 71.6% of the total urban population was exposed to anti-smoking information. (Table 2)

Awareness that smoking causes serious illness

As per the GATS-II, Table 4 & 5 depicts the awareness regarding the illness caused by tobacco smoking in all participants. About 92.1% overall of participants were aware of the illness caused by smoking. The majority (93%) of the people in the younger age group of 15-29 years were aware about the ill effects of tobacco smoking. Least proportion (88.9%) of the participants living in the west region of the country and also they have the lowest odds of having awareness about ill effects of tobacco than those living in the north part of the country ($AOR=0.48$, $CI=0.43-0.53$). The bivariate analysis shows a high level of awareness among the population residing in urban areas ($OR=1.37$, $CI=1.29-1.45$). The multivariate regression analysis shows that the odds of knowledge of the health hazard of tobacco smoking, were highest among adults who had higher secondary level and above education ($AOR^3=1.84$, $CI=1.65-2.04$). Regionally, north Indians have greater knowledge of the ill effects of tobacco smoking. Government and non-government employees were highly aware than the self-employed people, daily wage, and unemployed. However, the odds of the students having

¹ Odds ratio

² Confidence interval

³ Adjusted odds ratio

knowledge about the health hazards of tobacco smoking were higher than the government and non-government employees. (AOR=1.39, CI=1.20-1.62). Smokers had 0.92 times lower odds for having knowledge about the ill effects of tobacco smoking than non-smokers. (CI=0.85-1.00, $p = 0.04$). Most importantly, the people who noticed anti-smoking information on any kind of media had the highest odds of having the awareness that smoking causes serious illness. (AOR=1.51, CI=1.35-1.69) Although, who noticed anti-smoking information on Television had the highest odds of having the knowledge about the ill effects of the smoking. (AOR=1.46, CI=1.31-1.62)

Intention to quit among smokers

Table 6&7 shows the factors affecting the intention to quit smoking among smokers. Out of the total 9499, 55.1% of the smokers thought about quitting smoking. Only 23.5% of the female smokers showed intention to quit smoking, whereas the males had shown higher odds to think about quitting. (AOR=1.31, CI=1.02-1.67). Smokers in the west had the least intention to quit (19%), with the least odds of (AOR=0.18, CI=0.13-0.26) compared to the smokers in north India. Both unadjusted and adjusted logistic regression model reports intention to quite reduced with increasing age. Although, the odds were insignificant for the 30-44- & 45-59-years age groups compared with the 15-29 age group. Smokers who were in their 60s and above had shown lesser odds to think about quitting than smokers in the age group of 15-29 years. (AOR=0.8, CI=0.64-0.99). Smokers who noticed anti-smoking information on television had shown the highest odds of intention to quit than those who didn't notice any anti-smoking information (AOR=4.56, CI=3.93-5.30). Smokers who believed that smoking had caused harm to their bodies were more willing to quit smoking (AOR=1.14, CI=1.01-1.27). The users who were aware of the serious illness caused by tobacco smoking were 61% more likely to think about quitting than the users who were unaware. The adjusted multivariate analysis model

reports that the people who smoke daily were more willing to quit smoking than those who smoke less daily. (AOR=1.34, CI=1.18-1.53).

Table 1: Socio-demographic characteristics of the respondents, non-smokers, and smokers who participated in the second round of the Global Adult Tobacco Survey 2016-2017-India			
Characteristics	All respondents (n=74,037)	Non-Smokers (n=64538)	Smokers (n=9499)
Overall	100	87.2	12.8
Residence			
Rural	65.5	62.9	73.5
Urban	34.5	37.1	26.5
Region			
North	23.1	23.2	22.5
Central	15.6	15.6	15.1
East	13.3	13.6	11
North-east	18.3	16.3	32
West	10.7	11.6	4.5
South	19	19.6	14.8
Gender			
Male	51.1	39.3	88.8
Female	48.9	60.7	11.2
Age-group			
15-29 years	38.5	30.8	15.7
30-44 years	29.5	34.3	36.4
45-59 years	18.6	19.4	26.5
>=60 years	13.3	15.5	21.3
Education			
No formal schooling	25.3	24.4	29
Up to primary school	19.5	20.9	30.6
Up to secondary school	31.6	30.6	28.2
Higher secondary & above	23.5	24.2	12.2
Occupation			
Gov. and Non- gov. employees	10.9	12.8	14.2
Daily wage laborer	19.3	16.3	33.9
Self-employed	17.6	16.7	33.1
Student	13.2	9.2	1.8
Homemaker, retired and unemployed	39	44.9	16.9

Table 2: Sociodemographic characteristics of the population who noticed anti-smoking information on different media in India, GATS 2016–2017

Characteristics	Total (n)	On Electronic media		On Print media		On Public vehicles, walls	
		(n)	%	(n)	%	(n)	%
Overall	74037	52566	71	42201	57	33317	45
Age group							
15-29	21398	15942	74.5	13310	62.2	10549	49.3
30-44 years	25604	18640	72.8	15055	58.8	11880	46.4
45-59 years	15032	10583	70.4	8192	54.5	6404	42.6
> 60 years	12003	7466	62.2	5737	47.8	4321	36.0
Gender							
Female	40265	26535	65.9	18723	46.5	14495	36.0
Male	33772	26072	77.2	23573	69.8	18642	55.2
Residence							
Rural	47549	29908	62.9	23347	49.1	18354	38.6
Urban	26488	22727	85.8	18965	71.6	14833	56.0
Region							
North	17128	13754	80.3	10243	59.8	7930	46.3
Central	11518	6519	56.6	5655	49.1	4319	37.5
East	9834	5428	55.2	4504	45.8	3127	31.8
Northeast	13574	8606	63.4	6950	51.2	5212	38.4
West	7901	6052	76.6	5278	66.8	4409	55.8
South	14082	12265	87.1	9660	68.6	8153	57.9
Education level							
No schooling	18473	8294	44.9	4378	23.7	3399	18.4
Up to primary education	16368	11065	67.6	8348	51.0	6449	39.4
Up to secondary education	22440	18154	80.9	15528	69.2	12095	53.9
Higher secondary and above	16756	15131	90.3	14025	83.7	11193	66.8
Occupation							
Gov.& Non-gov employees	9614	8480	88.2	7903	82.2	6441	67.0
Daily wage	13749	8868	64.5	6861	49.9	5417	39.4
Self-employed	13955	10187	73.0	8708	62.4	6726	48.2
Student	6134	5220	85.1	4754	77.5	3828	62.4
Homemaker, Retired & unemployed	30585	19880	65.0	14069	46.0	10735	35.1
Smoking status							
No	64538	46080	71.4	36916	57.2	28978	44.9
Yes	9499	6526	68.7	5395	56.8	4151	43.7
Have TV							
No	67582	47307	70.0	38049	56.3	29736	44.0
Yes	6455	5345	82.8	4228	65.5	3421	53.0
Have Radio							
No	20400	7262	35.6	7446	36.5	5630	27.6
Yes	53637	45377	84.6	34810	64.9	27516	51.3

Have internet connection							
No	59248	39341	66.4	30690	51.8	23995	40.5
Yes	14789	13295	89.9	11580	78.3	9154	61.9
Have cell telephone							
No	6115	2116	34.6	1724	28.2	1260	20.6
Yes	67922	50534	74.4	40549	59.7	31923	47.0

(n) indicates the frequency of people who noticed the anti-smoking information,
% indicates the percentage of people who noticed the anti-smoking information

Table 3: Bivariate and multivariate analysis showing the noticeability of anti-smoking information on *any media among the participants from the Global Adult Tobacco Survey (India) round II (2016-2017)

Characteristics	TOTAL (n)	(n)	%	Unadjusted (Bivariate)			Adjusted (Multivariate)				
				Odds ratio	95% CI		p-value	Odds ratio	95% CI		p-value
Overall	74037	56268	76		Lower	Upper			Lower	Upper	
Age group											
15-29	21398	17054	79.7	Ref				Ref			
30-44 years	25604	19997	78.1	0.904	0.865	0.945	<0.001	1.07	1.01	1.14	<0.05
45-59 years	15032	11334	75.4	0.779	0.741	0.819	<0.001	1.02	0.95	1.08	0.62
> 60 years	12003	8054	67.1	0.519	0.493	0.546	<0.001	0.75	0.7	0.8	<0.001
Gender											
Female	40265	28306	70.3	Ref				Ref			
Male	33772	28132	83.3	2.115	2.041	2.192	<0.001	1.91	1.81	2.02	<0.001
Residence											
Rural	47549	32904	69.2	Ref				Ref			
Urban	26488	23521	88.8	3.543	3.395	3.699	<0.001	1.56	1.48	1.64	<0.001
Region											
North	17128	14250	83.2	Ref				Ref			
Central	11518	7567	65.7	0.387	0.366	0.409	<0.001	0.8	0.75	0.86	<0.001
East	9834	6136	62.4	0.337	0.318	0.356	<0.001	0.81	0.75	0.87	<0.001
Northeast	13574	9448	69.6	0.463	0.439	0.489	<0.001	0.58	0.55	0.62	<0.001
West	7901	6424	81.3	0.878	0.819	0.941	<0.001	0.98	0.91	1.06	0.66
South	14082	12632	89.7	1.77	1.654	1.894	<0.001	2.12	1.96	2.29	<0.001
Education level											
No schooling	18473	9273	50.2	Ref				Ref			<0.001
Up to primary education	16368	12161	74.3	2.872	2.744	3.005	<0.001	2.14	2.03	2.26	<0.001
Up to secondary education	22440	19343	86.2	6.211	5.922	6.514	<0.001	3.5	3.3	3.7	<0.001
Higher secondary and above	16756	15667	93.5	14.21	13.279	15.21	<0.001	4.89	4.51	5.3	<0.001
Occupation											
Gov.& Non-gov employees	9614	8845	92	Ref				Ref			
Daily wage	13749	9844	71.6	0.218	0.201	0.237	<0.001	0.82	0.75	0.91	<0.001
Self-employed	13955	11066	79.3	0.333	0.306	0.362	<0.001	0.79	0.72	0.87	<0.001
Student	6134	5502	89.7	0.752	0.673	0.84	<0.001	0.92	0.81	1.05	0.21

Homemaker, Retired & unemployed	30585	21195	69.3	0.196	0.181	0.211	<0.001	0.63	0.57	0.69	<0.001
Smoking status											
No	64538	49307	76.4	Ref				Ref			
Yes	9499	7172	75.5	0.952	0.906	1.001	0.056	1.02	0.96	1.09	0.56
Have TV											
No	67582	50957	75.4	Ref				Ref			
Yes	6455	5519	85.5	1.934	1.8	2.077	<0.001	1.36	1.25	1.48	<0.001
Have Radio											
No	20400	9812	48.1	Ref				Ref			
Yes	53637	46611	86.9	7.169	6.907	7.441	<0.001	3.85	3.68	4.04	<0.001
Have internet connection											
No	59248	42836	72.3	Ref				Ref			
Yes	14789	13635	92.2	4.551	4.274	4.846	<0.001	1.54	1.43	1.66	<0.001
Have cell telephone											
No	6115	2611	42.7	Ref				Ref			
Yes	67922	53862	79.3	5.128	4.859	5.413	<0.001	1.73	1.62	1.84	<0.001

*Any media includes noticing information on newspapers/TV/Cinema/Billboards/Internet/Public vehicles/Public walls/others
(n) Indicates the frequency of the population that noticed anti-smoking information on any media
% Indicates the percentage of the population that noticed anti-smoking information on any media
Ref=Reference category, CI=Confidence Interval

Table 4: Awareness that smoking causes serious illness among the participants of the Global Adults Tobacco Survey (India)-round II (2016–2017)

Characteristics	Total(n)	(n)	%
Overall	74037	68188	92.1
Age group			
15-29	21398	19900	93.0
30-44 years	25604	23735	92.7
45-59 years	15032	13814	91.9
> 60 years	12003	10731	89.4
Residence			
Rural	47549	43412	91.3
Urban	26488	24766	93.5
Region			
North	17128	16152	94.3
Central	11518	10723	93.1
East	9834	8978	91.3
Northeast	13574	12244	90.2
West	7901	7024	88.9
South	14082	13054	92.7
Education level			
No schooling	18473	16164	87.5

Up to primary education	16368	14911	91.1
Up to secondary education	22440	21161	94.3
Higher secondary and above	16756	15952	95.2
Occupation			
Gov.& Non-gov employees	9614	8979	93.4
Daily wage	13749	12484	90.8
Self-employed	13955	12797	91.7
Student	6134	5821	94.9
Homemaker, Retired & unemployed	30585	28108	91.9
Smoking status			
No	64538	59569	92.3
Yes	9499	8635	90.9
Noticed anti-smoking information			
Newspaper			
No	46538	42010	90.3
Yes	27499	26172	95.2
Television			
No	23422	20299	86.7
Yes	50615	47883	94.6
Radio			
No	66059	60596	91.7
Yes	7978	7586	95.1
Billboards			
No	48961	44271	90.4
Yes	25076	23911	95.4
Cinemas			
No	50640	45959	90.8
Yes	23397	22223	23397
Internet			
No	68215	65650	91.8
Yes	5822	5532	95
Public vehicles			
No	45947	41438	90.2
Yes	28090	26744	95.2
Public walls			
No	49858	45277	90.8
Yeas	24179	22905	94.7
Noticed anti-smoking information on any media			
No	17592	14953	85.0
Yes	56445	53228	94.3

(n) indicates the number of people aware that smoking causes serious illness
 % indicated the percentage of people aware that smoking causes serious illness

Table 5: Bivariate and multivariate analysis showing awareness that smoking causes illness among the participants from Global Adult Tobacco Survey(2016-2017)

	Unadjusted (Bivariate)				Adjusted (Multivariate)			
	Odds ratio	95% CI		p-value	Odds ratio	95% CI		p-value
Characteristics		Lower	Upper			Lower	Upper	
Age group								
15-29	Ref				Ref			
30-44 years	0.96	0.9	1.03	0.29	1.15	1.07	1.24	<0.001
45-59 years	0.86	0.8	0.93	<0.001	1.15	1.05	1.25	<0.001
>_60 years	0.64	0.59	0.69	<0.001	0.93	0.85	1.01	0.085
Residence								
Rural	Ref				Ref			
Urban	1.37	1.29	1.45	<0.001	0.95	0.89	1.02	0.133
Region								
North	Ref				Ref			
Central	0.81	0.73	0.89	<0.001	1.13	1.02	1.25	0.017
East	0.63	0.57	0.69	<0.001	0.87	0.79	0.96	0.008
Northeast	0.55	0.51	0.6	<0.001	0.68	0.62	0.74	<0.001
West	0.48	0.44	0.53	<0.001	0.48	0.43	0.53	<0.001
South	0.77	0.7	0.84	<0.001	0.69	0.63	0.76	<0.001
Education level								
No schooling	Ref				Ref			
Up to primary education	1.45	1.36	1.56	<0.001	1.25	1.16	1.35	<0.001
Up to secondary education	2.36	2.2	2.53	<0.001	1.71	1.57	1.85	<0.001
Higher secondary and above	2.82	2.6	3.07	<0.001	1.84	1.65	2.04	<0.001
Occupation								
Gov.& Non-gov employees	Ref				Ref			
Daily wage	0.71	0.64	0.78	<0.001	1.28	1.14	1.43	<0.001
Self-employed	0.79	0.71	0.87	<0.001	1.14	1.02	1.27	0.017
Student	1.33	1.16	1.53	<0.001	1.39	1.20	1.62	<0.001
Homemaker,Retired & unemployed	0.81	0.74	0.88	<0.001	1.41	1.28	1.56	<0.001
Smoking status								
No	Ref				Ref			
Yes	0.834	0.773	0.899	<0.001	0.92	0.85	1.00	0.04
Noticed anti-smoking information								
On Newspaper								
No	Ref				Ref			

Yes	2.126	1.996	2.264	<0.001	1.08	1.00	1.17	0.05
On Television								
No	Ref				Ref			
Yes	2.696	2.555	2.846	<0.001	1.46	1.31	1.62	<0.001
On Billboards								
No	Ref				Ref			
Yes	2.174	2.035	2.323	<0.001	1.27	1.16	1.39	<0.001
On Radio								
No	Ref				Ref			
Yes	1.745	1.57	1.938	<0.001	1.09	0.98	1.22	0.123
On cinema								
No	Ref				Ref			
Yes	1.928	1.805	2.059	<0.001	1.10	1.02	1.19	0.01
On internet								
No	Ref				Ref			
Yes	1.694	1.501	1.913	<0.001	0.84	0.73	0.96	0.012
On public vehicles								
No	Ref				Ref			
Yes	2.162	2.03	2.302	<0.001	1.31	1.20	1.44	<0.001
On public walls								
No	Ref				Ref			
Yes	1.819	1.706	1.939	<0.001	0.85	0.77	0.93	<0.001
On any media								
No	Ref				Ref			
Yes	2.921	2.766	3.085	<0.001	1.51	1.35	1.69	<0.001

Table 6: Smokers who intend to quit smoking from Global Adults Tobacco Survey (India) round II (2016–2017)

Characteristics	Total smokers(n)	Smokers who intend to quit(n)	Smokers who intend to quit %
Overall	9499	5234	55.1
Gender			
Female	1065	250	23.5
Male	8434	3947	46.8
Residence			
Rural	6980	2925	41.9
Urban	2519	1270	50.4
Region			
North	2136	1102	51.6
Central	1438	610	42.4
East	1044	473	45.3
Northeast	3044	1154	37.9
West	431	82	19.0
South	1406	773	55.0

Education level			
No formal schooling	2754	823	29.9
Up to primary education	2909	1280	44.0
Up to secondary education	2681	1426	53.2
Higher secondary and above	1155	661	57.2
Occupation			
Gov. and Non- gov. employees	1351	739	54.7
Daily wage laborer	3220	1410	43.8
Self-employed	3148	1470	46.7
Student	174	84	48.3
Homemaker, retired and unemployed	1606	491	30.6
Age			
15-29	1492	715	47.9
30-44	3462	1627	47.0
45-59	2517	1097	43.6
>=60 years	2028	754	37.2
Noticed anti-smoking information on			
Newspaper/magazine			
No	6041	1945	32.2
Yes	3458	2248	65.0
Television			
No	3309	526	15.9
Yes	6190	3664	59.2
Radio			
No	8268	3340	40.4
Yes	1231	856	69.5
Billboards/Hoardings			
No	6484	2198	33.9
Yes	3015	1993	66.1
Cinema			
No	6977	2540	36.4
Yes	2522	1649	65.4
Internet			
No	9035	3885	43.0
Yes	464	311	67.0
Public vehicles			
No	5934	1893	31.9
Yes	3565	2299	64.5
Public walls			
No	6676	2323	34.8
Yes	2823	1872	66.3
Smoking frequency			
Daily	7647	3281	42.9
Less than daily	1852	909	49.1
Age of initiation of daily smoking			
>25 years	2239	985	44.0
15-25 years	4757	2046	43.0
<15 years	651	252	38.7
Noticed any smoking promotions or advertisement			
No	6523	2720	41.7
Yes	1993	1084	54.4
Has smoking already done harm to your body			

No	4566	1840	40.3
Yes	4933	2353	47.7
Awareness that smoking causes serious illness			
No	867	204	23.5
Yes	8632	3988	46.2

Table 7: Bivariate and multivariate analysis showing factors affecting the intention to quit among smokers from the Global Adult Tobacco Survey (India) round II (2016-2017)

	Unadjusted (Bivariate)				Adjusted (Multivariate)			
Characteristics	Odds ratio	95% CI			Odds ratio	95% CI		
		Lower	Upper	p-value		Lower	Upper	p-value
Gender								
Female	Ref				Ref			
Male	2.86	2.47	3.32	<0.001	1.31	1.02	1.67	0.030
Residence								
Rural	Ref				Ref			
Urban	1.41	1.29	1.55	<0.001	0.76	0.66	0.86	<0.001
Region								
North	Ref				Ref			
Central	0.69	0.60	0.79	<0.001	0.89	0.74	1.08	0.243
East	0.78	0.67	0.90	<0.001	0.84	0.68	1.04	0.109
Northeast	0.57	0.51	0.64	<0.001	0.59	0.50	0.69	<0.001
West	0.22	0.17	0.29	<0.001	0.18	0.13	0.26	<0.001
South	1.15	1.00	1.31	<0.001	0.88	0.73	1.07	0.191
Education level								
No formal schooling	Ref				Ref			
Up to primary education	1.84	1.65	2.06	<0.001	1.13	0.96	1.32	0.144
Up to secondary education	2.67	2.38	2.98	<0.001	1.08	0.91	1.28	0.373
Higher secondary and above	3.13	2.72	3.61	<0.001	1.00	0.79	1.26	0.989
Occupation								
Gov. and Non- gov. employees	Ref				Ref			
Daily wage laborer	0.65	0.57	0.73	<0.001	1.23	1.02	1.50	0.030
Self-employed	0.73	0.64	0.82	<0.001	1.13	0.94	1.36	0.185
Student	0.77	0.56	1.06	0.110	0.66	0.38	1.14	0.137
Homemaker, retired and unemployed	0.37	0.31	0.42		0.91	0.72	1.15	0.433
Age								
15-29	Ref			<0.001	Ref			0.07
30-44	0.97	0.86	1.09	0.566	0.97	0.81	1.17	0.744
45-59	0.84	0.74	0.96	<0.001	0.88	0.72	1.07	0.191
>=60 years	0.65	0.56	0.74		0.80	0.64	0.99	<0.001
Noticed anti-smoking information on								
Newspaper/magazine								

No	Ref				Ref			
Yes	3.91	3.58	4.27	<0.001	1.51	1.32	1.72	<0.001
Television								
No	Ref				Ref			
Yes	7.67	6.90	8.53	<0.001	4.56	3.93	5.30	<0.001
Radio								
No	Ref				Ref			
Yes	3.37	2.97	3.84	<0.001	1.79	1.50	2.13	<0.001
Billboards/Hoardings								
No	Ref				Ref			
Yes	3.79	3.46	4.15	<0.001	1.29	1.12	1.50	0.001
Cinema								
No	Ref				Ref			
Yes	3.30	3.00	3.63	<0.001	1.39	1.21	1.59	<0.001
Internet								
No	Ref				Ref			
Yes	2.70	2.21	3.29	<0.001	0.84	0.63	1.11	0.21
Public vehicles								
No	Ref				Ref			
Yes	3.88	3.56	4.24	<0.001	1.39	1.21	1.61	<0.001
Public walls								
No	Ref				Ref			
Yes	3.70	3.37	4.06	<0.001	1.48	1.27	1.71	<0.001
Smoking frequency								
Daily	Ref				Ref			
Less than daily	0.78	0.71	0.86	<0.001	1.34	1.18	1.53	<0.001
Age of initiation of daily smoking								
>25 years	Ref				Ref			
15-25 years	0.96	0.87	1.06	0.449	0.90	0.73	1.11	0.332
<15 years	0.80	0.67	0.96	<0.001	1.16	0.93	1.45	0.195
Noticed any smoking promotions or advertisement								
No	Ref				Ref			
Yes	1.67	1.51	1.85	<0.001	1.08	0.94	1.23	0.278
Has smoking already done harm to your body								
No	Ref				Ref			
Yes	1.35	1.24	1.46	<0.001	1.14	1.01	1.27	0.03
Awareness that smoking causes serious illness								
No	Ref				Ref			
Yes	2.79	2.37	3.29	<0.001	1.61	1.28	2.02	<0.001

Ref=Reference

CI=Confidence Interval

category

Discussion

This study explored the reach of different types of media with anti-smoking information according to different background characteristics in India. Our study showed that amongst the three media types, the greatest number of people had noticed anti-smoking information on electronic media. This result is in alignment with the previous study on GATS I. (3) Having access to electronic media had caused increased level in awareness about the harmful effects of tobacco smoking. (3) The study reported the males are more likely to notice the anti-smoking information than females in all types of media, the similar findings had been reported in the previous study conducted on GATS I survey. Compared to that study the overall percentage of noticing anti-smoking information on electronic media had improved somewhat. There is a pronounced difference in urban and rural areas regarding the reach of anti-smoking information. Only 69 % of the population living in rural areas had noticed the information in any type of media. Perhaps among the three types, the greatest number of people have observed the information on electronic media. Although, it does highlight the need for innovative strategies to reach and impact the anti-smoking/anti-tobacco campaigns in rural areas. (3) But higher levels of education had independently been linked to noticing the anti-smoking ads. This might be because of India's rising literacy rate over the past ten years and rising educational levels, which make it easier to observe changes. (11) Even this study has shown an increase in awareness level as the educational level increases. Studies have shown that most tobacco users were likely to be illiterate. These people also initiate tobacco smoking at very early age. (13) The campaigns should reiterate the strategies to focus on the people who had not done their formal schooling, as they are among the vulnerable group who may fall into the habit of tobacco smoking. (2,13)

The awareness level about hazards of the tobacco smoking has been assessed in this study. We found that there are significant disparities among different demographic characteristics.

Our logistic regression analysis had shown that the awareness level is lesser in the people who were in the age group of 60 years and older, this can be because of their belief that tobacco use is not related to any serious illness, as there might be a lesser number of smokers, they have seen with major health issues. (5) This can be the reason in lesser intention to quit smoking as the age increases. Some studies conducted previously had also shown the same results about the intention to quit. (18,19) The unpublished regression analysis of our study had reported that male smokers are 63% more likely to be aware about the harmful effects of tobacco smoking than female smokers. This disparity should be addressed with a need to improve awareness through a gender-neutral approach. (5) Women often have much higher estimation of the likelihood of smoking-related death than men, and they have the power to change the smoking habits of the men in their families. Including women and families in social media advertisements and broadcasts can be one of the techniques to improve the awareness level of women. (5,16,21) Smokers were 4% less likely to be aware about dangers of tobacco smoking than non-smokers. Interestingly 90.9% of smokers were aware of the dangers of smoking. The factor here should be taken into consideration if there is any mediator in individuals' decision to continue the smoking habit. Additionally, the way knowledge is gained affects the consuming behavior whether it is general or specific. While individualized knowledge is tied to personal risk and is expected to be more successful in promoting behavioral change, generalized knowledge would be related to overall harmful impacts on the broader population. (21) Furthermore, our study had shown that the people who noticed the information about, 'the dangers of smoking or that encourages quit smoking' on any media were likely to be more aware than the ones who didn't notice any anti-smoking messages. Personal accounts of the repercussions of smoking may elicit high or low levels of emotion depending on the story and the extent to which smokers relate to the characters, unlike anti-smoking advertisements that use strong visual images of the dangers of smoking. There is no specific persuasive goal

against which smokers may react, therefore less emotional human testimonials may nevertheless be more powerful than other less emotional advertisements since health information is provided in a narrative manner, which people are naturally trained to comprehend from a young age. (14)

When we analyzed the factors affecting the intention to quit smoking in smokers, it was reported that smokers residing in urban areas were 34% less likely to intend to quit than their rural counterparts. The study raises awareness of tobacco control officers in the west and northeast India to strengthen anti-tobacco measures like raising public knowledge of the risks associated with cigarette usage. Cigarettes and Other Tobacco Products Act (COTPA) legislation is being enforced more strictly in the media to increase these regions' willingness to quit rates. (11) If we compare the association between different types of media exposure with anti-smoking messages and intention to quit, noticeability on almost all the media was related to higher odds of intending to quit. This could be attributed to the impact of mass media in enhancing the efficacy of tobacco control interventions. (3) People who believed that smoking has already caused harm to their bodies were found to be 14% more likely to think about quitting. The perception could be due to their experience of illness related to tobacco smoking, which led them to think about quitting.

Conclusion

The present study reports the prevalence of the noticeability of the anti-smoking information on different types of media sources, the awareness level about the dangers of tobacco smoking, and the intention to quit smoking among smokers.

One common finding which emerged through this analysis was that the people who have television at their home had highly significant odds of noticing the anti-smoking information as well as of having knowledge that smoking leads to serious illness. Interestingly, the smokers

who recall noticing information that encouraged them to quit smoking on TV had four times higher odds of having the intention to quit than those who didn't notice any such information.

In India, the total population who have a TV in their household has increased from 197 million in 2018 to 210 million in 2020. (22) Even in remote villages where social media and the internet may not yet be widely available, television has an impact. The above points show how seldom television is used in India to communicate public health issues, particularly those related to tobacco control. The COTPA Act 2003 inhibited the promotion of tobacco, but this caters to half of the issue. A more focused approach should be used to form preventive and educative advertising to convey the harms and promote smokers to quit.

References

- 1) Tripathy JP, Verma M. Impact of health warning labels on cigarette packs in India: findings from the global adult tobacco survey 2016–17. *Behavioral Medicine*. 2022 Jul 3;48(3):171-80.
- 2) Reddy KS, Gupta PC. Tobacco control in India. New Delhi: ministry of health and family welfare, Government of India. 2004:43-7.
- 3) Singh SK, Schensul JJ, Kashyap GC. The reach of media to smokers and smokeless tobacco users in India: Evidence from the Global Adult Tobacco Survey (GATS). *Journal of Population and Social Studies [JPSS]*. 2018;26(1):42-52.
- 4) <https://nada.searo.who.int/index.php/catalog/73/sampling>
- 5) Kankaria A, Sahoo SS, Verma M. Awareness regarding the adverse effect of tobacco among adults in India: findings from secondary data analysis of Global Adult Tobacco Survey. *BMJ open*. 2021 Jun 1;11(6):e044209.
- 6) Viswanath K, Ackerson LK, Sorensen G, Gupta PC. Movies and TV influence tobacco use in India: findings from a national survey. *PLoS One*. 2010 Jun 29;5(6):e11365.
- 7) Caixeta RB, Sinha DN, Khoury RN, Rarick J, Fouad H, d'Espaignet ET, Bettcher D, Andes LJ, Palipudi K, Asma S. Antismoking messages and intention to quit—17 countries, 2008–2011. *Morbidity and Mortality Weekly Report*. 2013 May 31;62(21):417.
- 8) Bhawna G. Burden of smoked and smokeless tobacco consumption in India-results from the global adult tobacco survey India (GATS-India)-2009-2010. *Asian Pacific Journal of Cancer Prevention*. 2013;14(5):3323-9.
- 9) Srivastava S, Malhotra S, Harries AD, Lal P, Arora M. Correlates of tobacco quit attempts and cessation in the adult population of India: secondary analysis of the Global Adult Tobacco Survey, 2009–10. *BMC Public Health*. 2013 Dec;13(1):1-8.

- 10) Bhatt G, Goel S, Soundappan K, Kaur R. Theoretical constructs of smoking cessation among current tobacco smokers in India: a secondary analysis of Global Adult Tobacco Survey-2 (2016–2017). *BMJ open*. 2022 Jan 1;12(1):e050916.
- 11) Kar SS, Sivanantham P, Rehman T, Chinnakali P, Thiagarajan S. Willingness to quit tobacco and its correlates among Indian tobacco users—Findings from the Global Adult Tobacco Survey India, 2016–17. *Journal of Postgraduate Medicine*. 2020 Jul;66(3):141.
- 12) <https://www.who.int/news-room/fact-sheets/detail/tobacco>
- 13) Sharma D, Goel S, Lal P. Education differential in relation to tobacco use and its predictors across different regions of India. *Indian Journal of Cancer*. 2017 Jul 1;54(3):584.
- 14) Durkin SJ, Biener L, Wakefield MA. Effects of different types of antismoking ads on reducing disparities in smoking cessation among socioeconomic subgroups. *American journal of public health*. 2009 Dec;99(12):2217-23.
- 15) Sinha DN, Palipudi KM, Oswal K, Gupta PC, Andes LJ, Asma S. Influence of tobacco industry advertisements and promotions on tobacco use in India: findings from the Global Adult Tobacco Survey 2009-2010. *Indian journal of cancer*. 2014 Dec 1;51(5):13.
- 16) Menon I, Parkash H. Women and tobacco: A total misfit or mis-unfit. *Indian Journal of Dental Research*. 2012 Jul 1;23(4):537.
- 17) Global Adult Tobacco Survey: India 2016-17 Report
<https://ntcp.nhp.gov.in/assets/document/surveys-reports-publications/Global-Adult-Tobacco-Survey-Second-Round-India-2016-2017.pdf>
- 18) Lam TH, Li ZB, Ho SY, et al. Smoking, quitting and mortality in an elderly cohort of 56,000 Hong Kong Chinese. *Tob Control* 2007; 16:182–9.

- 19) Gilman SE, Martin LT, Abrams DB, et al. educational attainment and cigarette smoking: a causal association? *Int J Epidemiol* 2008; 37:615–24.
- 20) Gupta B, Kumar N. A Cross-Country comparison of knowledge, attitudes and practices about tobacco use: findings from the global adult tobacco survey. *Asian Pacific Journal of Cancer Prevention* 2014;15:5035–42.
- 21) Chinwong D, Mookmanee N, Chongpornchai J. A comparison of gender differences in smoking behaviors. *Intention to Quit, and Nicotine Dependence among Thai University Students*, 2018.
- 22) Jha, Lata, et al. "TV-owning households grew 6.9% in 2018-2020, says BARC | Mint" *Livemint*, 15 Apr. 2021, <https://www.livemint.com/news/india/households-owning-tv-sets-grow-7-during-2018-20-barc-11618476297643.html>. Accessed 13 Oct. 2020.